



US011025811B1

(12) **United States Patent**
Matheson

(10) **Patent No.:** US 11,025,811 B1
(45) **Date of Patent:** Jun. 1, 2021

- (54) **SYSTEM FOR LIVE STREAMING A TRAIL CAMERA**
- (71) Applicant: **Scott Matheson**, Plymouth, WI (US)
- (72) Inventor: **Scott Matheson**, Plymouth, WI (US)
- (*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.
- (21) Appl. No.: **16/732,320**
- (22) Filed: **Jan. 1, 2020**

- | | | | | |
|--------------|------|---------|-----------------|-----------------------|
| 2009/0189981 | A1 * | 7/2009 | Siann | H04N 7/188
348/143 |
| 2010/0045773 | A1 * | 2/2010 | Ritchey | H04N 5/2254
348/36 |
| 2013/0202274 | A1 * | 8/2013 | Chan | H04N 7/185
386/362 |
| 2014/0218519 | A1 * | 8/2014 | Borovinov | A61G 99/00
348/143 |
| 2017/0200296 | A1 * | 7/2017 | Jones | G06F 40/58 |
| 2018/0220506 | A1 * | 8/2018 | Sadwick | H05B 45/10 |
| 2018/0342329 | A1 * | 11/2018 | Rufo | H04L 12/2812 |
| 2019/0020530 | A1 * | 1/2019 | Au | H04L 5/0057 |
| 2019/0244498 | A1 * | 8/2019 | Dumas | H04W 4/023 |
| 2020/0294401 | A1 * | 9/2020 | Kerecsen | G05D 1/0287 |
| 2021/0070441 | A1 * | 3/2021 | Walsh | B64C 39/024 |

* cited by examiner

Related U.S. Application Data

- (60) Provisional application No. 62/822,430, filed on Mar. 22, 2019.
- (51) **Int. Cl.**
H04N 5/00 (2011.01)
H04N 5/232 (2006.01)
A01M 31/00 (2006.01)
H04N 5/225 (2006.01)
- (52) **U.S. Cl.**
CPC *H04N 5/23206* (2013.01); *A01M 31/002* (2013.01); *H04N 5/2252* (2013.01)
- (58) **Field of Classification Search**
CPC H04N 5/23206; H04N 5/2252; A01M 31/002
See application file for complete search history.

Primary Examiner — Zhihan Zhou

(74) *Attorney, Agent, or Firm* — Donald J. Ersler

(57) **ABSTRACT**

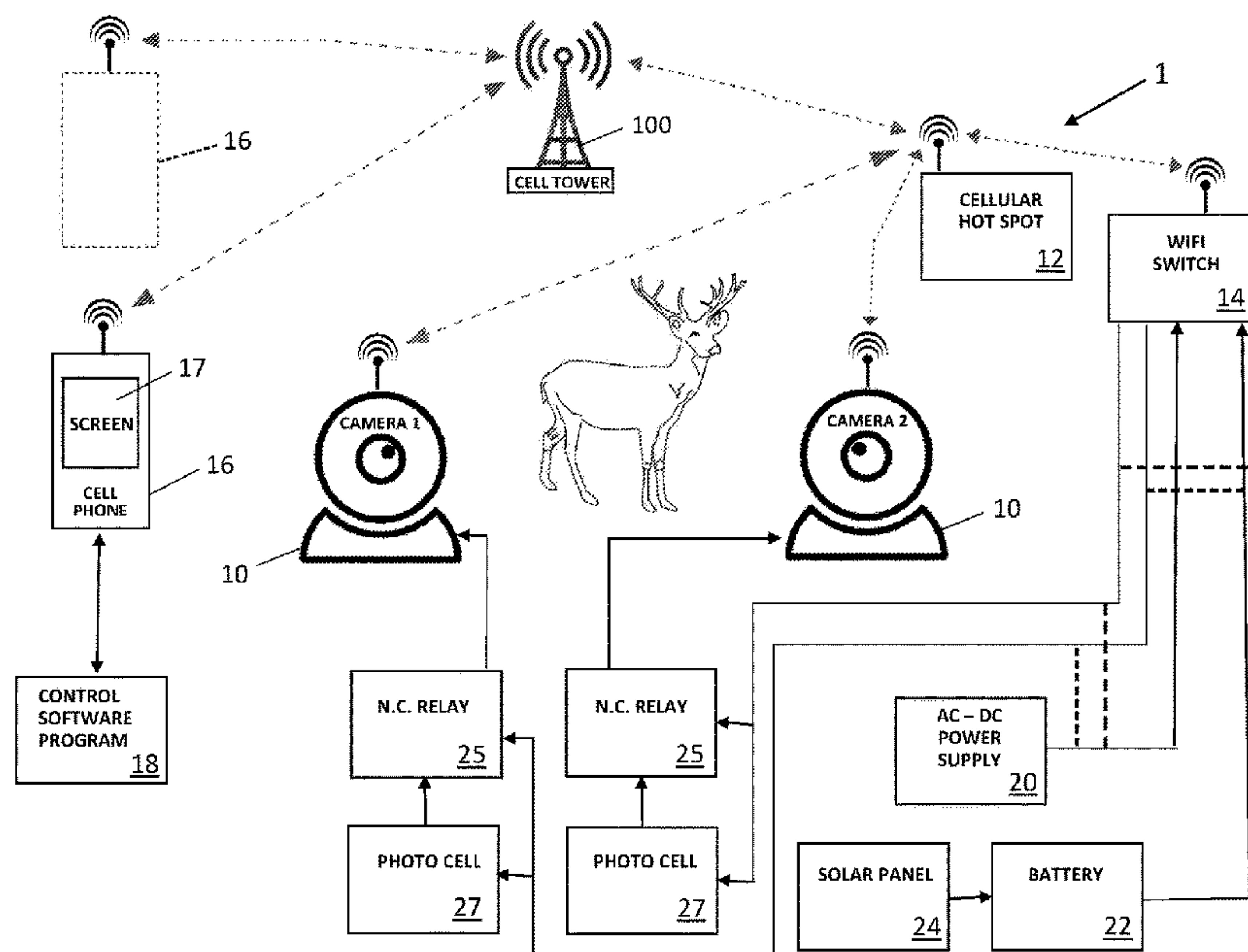
A system for live streaming a trail camera preferably includes a position adjustable camera, a cellular hotspot, a power source, a WiFi switch, a wireless device and a control software program. The position adjustable camera includes being actuated by a motion detector; the capability of being remotely operated; and the ability to live stream images and video including sound. The cellular hotspot converts a cellular signal to a WiFi signal, or a WiFi signal to a cellular signal. The WiFi switch allows operation of the position adjustable camera. The control software program provides an interface between the user and control of the position adjustable camera. The control software program includes choosing between livestream and still images; powering the position adjustable camera; controlling the pan, tilt and zoom of the position adjustable camera; triggering of camera operation; choice of multiple cameras; image inversion; and storage of images in an images gallery.

(56) **References Cited**

U.S. PATENT DOCUMENTS

- | | | | | |
|------------|------|---------|---------------|------------|
| 10,001,425 | B1 * | 6/2018 | Olsson | G01M 3/005 |
| 10,491,414 | B1 * | 11/2019 | Weed | G06F 21/85 |
| 10,784,696 | B1 * | 9/2020 | Pereira | G09G 5/10 |

18 Claims, 2 Drawing Sheets



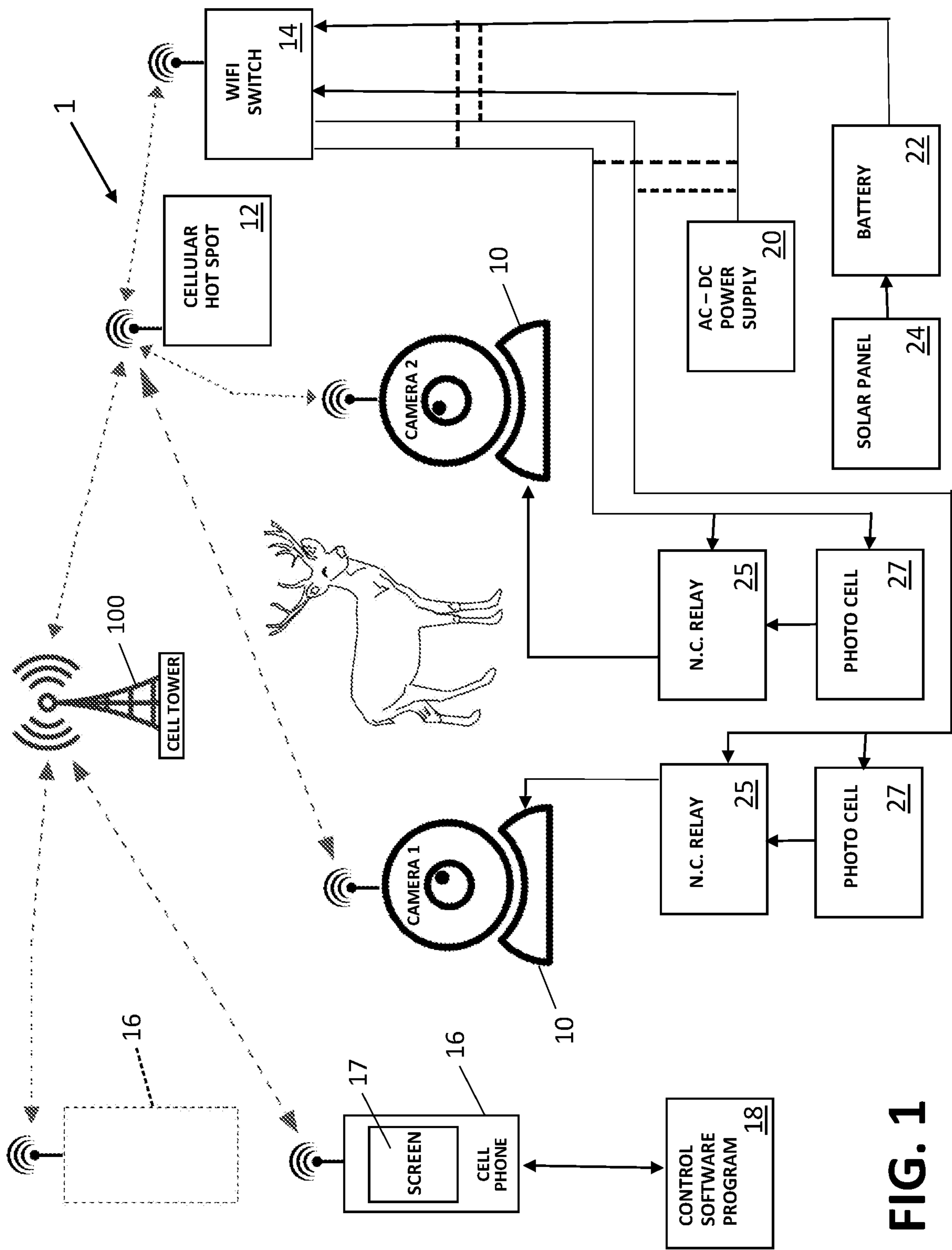


FIG. 1

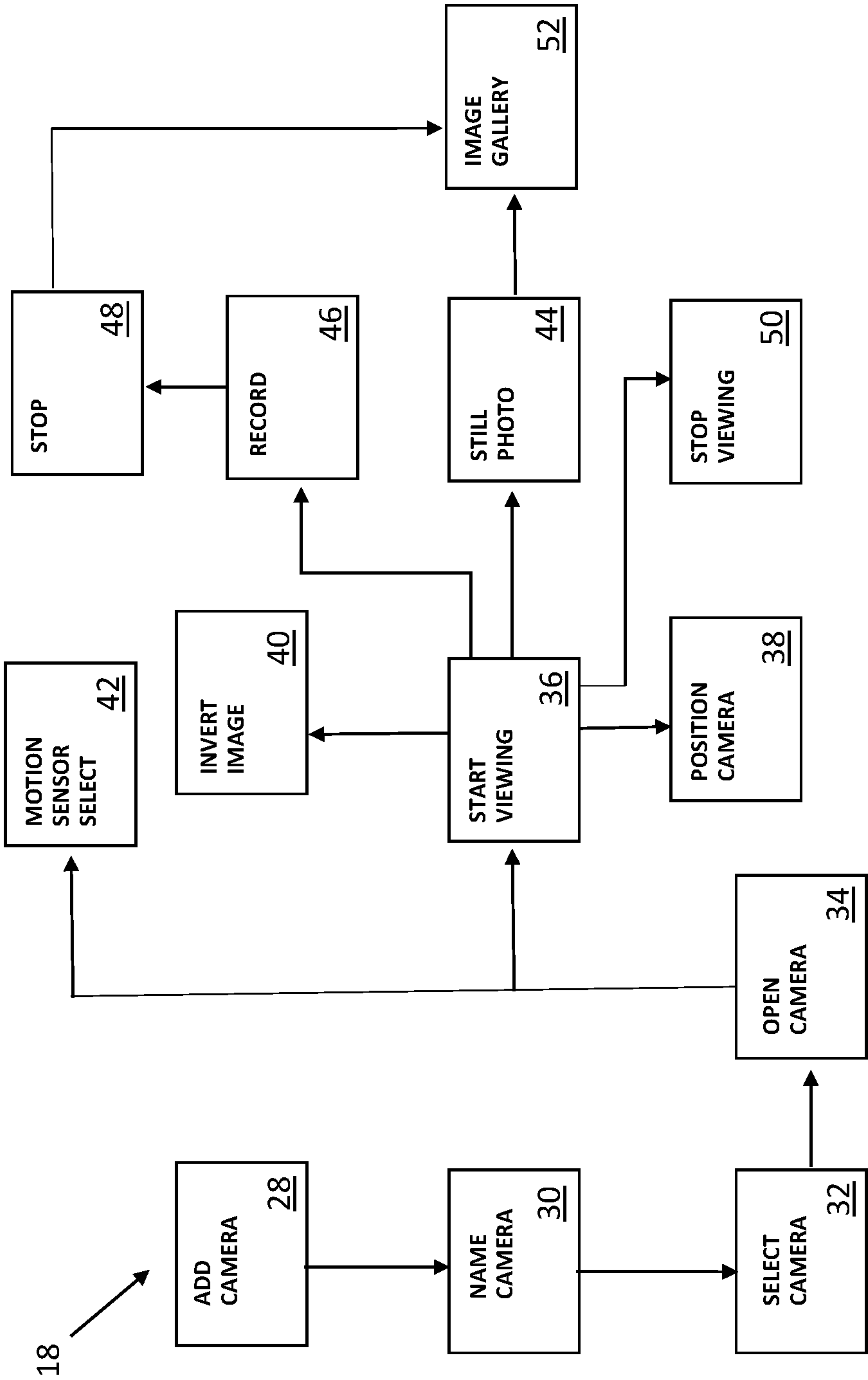


FIG. 2

1**SYSTEM FOR LIVE STREAMING A TRAIL CAMERA****CROSS-REFERENCES TO RELATED APPLICATIONS**

This is a nonprovisional application, which claims the benefit of provisional application No. 62/822,430 filed on Mar. 22, 2019.

BACKGROUND OF THE INVENTION**Field of the Invention**

The present invention relates generally to capturing wildlife images and more specifically to a system for live streaming a trail camera, which allows live streaming of wildlife and transmission of the live streaming to a remote location.

Discussion of the Prior Art

The state of the art in trail cameras uses a digital camera, which is triggered by a motion sensor. An animal walks in front of the motion sensor and the digital camera is activated to take a photo or video of the animal. The image or video is stored on an SD card for manual retrieval. Recently, technology has been developed that will transmit the image or video to an email. Additionally, multiple cameras can be connected to a hub, which receives photos or videos from the multiple cameras.

Accordingly, there is a clearly felt need in the art for a system for live streaming a trail camera, which allows live streaming of wildlife, transmission of the live streaming to a remote location and the ability to adjust different parameters of the trail camera, such as pan, tilt and zoom during the live streaming.

SUMMARY OF THE INVENTION

The present invention provides a system for live streaming a trail camera, which allows live streaming of wildlife and transmission of the live streaming to a remote location. The system for live streaming a trail camera preferably includes at least one position adjustable camera, a cellular hotspot, a power source, a WiFi switch, a wireless device and a control software program. However, the WiFi switch is optional. The position adjustable camera includes being actuated by a selectable motion detector; the capability of being remotely operated; and the ability to live stream images and video including sound. The camera includes the ability to be turned on and off; panning 360 degrees; and tilt-trim 120 degrees. The cellular hotspot converts a cellular signal to a WiFi signal, or a WiFi signal to a cellular signal. The power source may be a DC power supply powered by an electrical outlet; a storage battery; or a solar panel and storage battery combination.

The combination of a photocell and a normally closed relay may be used to operate each camera during the day, thus saving battery power. The photocell detects when dusk and sunrise occur. The photocell includes a photocell output. The photocell output provides a voltage high between dusk and dawn, and a voltage low during daytime. The normally closed relay includes a trigger input, a power input and a power output. The photocell output is connected to the trigger of the normally closed relay. A power output of the WiFi switch is connected to a power input of the normally

2

closed relay. The power output of the normally closed relay is connected to a power input of the camera.

The WiFi switch allows operation of the position adjustable camera. The wireless device is preferably a smart cellular phone. The control software program is loaded on to a wireless phone with a platform, such as Android or Apple. The control software program provides an interface between the user and control of the position adjustable camera. The control software program includes choosing between live-stream, video recording and still images; powering the position adjustable camera; controlling the pan, tilt and zoom of the position adjustable camera; selectable triggering of camera operation; choice of controlling multiple cameras; image inversion; and storage of images and video in an images gallery.

Accordingly, it is an object of the present invention to provide a system for live streaming a trail camera, which allows live streaming of wildlife.

It is further object of the present invention to provide a system for live streaming a trail camera, which allows transmission of the live streaming to a remote location.

Finally, it is another object of the present invention to provide a system for live streaming a trail camera, which allows different parameters of the trail camera to be adjusted, such as pan, tilt and zoom during the live streaming.

These and additional objects, advantages, features and benefits of the present invention will become apparent from the following specification.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a schematic diagram of a system for live streaming a trail camera in accordance with the present invention.

FIG. 2 is a schematic diagram of control software program for a system for live streaming a trail camera in accordance with the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

With reference now to the drawings, and particularly to FIG. 1, there is shown a schematic diagram of a system for live streaming a trail camera 1. The system for live streaming a trail camera 1 preferably includes a position adjustable camera 10, a cellular hotspot 12, a power source, a WiFi switch 14, a wireless device 16 and a control software program 18. However, the WiFi switch 14 is optional. The position adjustable camera 10 includes being actuated by a selectable motion detector; the capability of being remotely operated; and the ability to live stream, record images and video including sound. The position adjustable camera 10 includes the ability to be turned on and off; panning 360 degrees; and tilt-trim 120 degrees. The position adjustable camera 10 may also include night vision capability. The cellular hotspot 12 converts a cellular signal to a WiFi signal, or a WiFi signal to a cellular signal. The power source may be an AC-DC power supply 20 powered by an electrical outlet; a storage battery 22; or a combination of a solar panel 24 and the storage battery 22.

The combination of a normally closed relay 25 and a photocell 27 may be used to only power each camera 10 during the day, thus saving battery power. The photocell 27 detects when dusk and sunrise occur. The photocell 27 includes a photocell output. The photocell output provides a voltage high between dusk and dawn, and a voltage low

3

during daytime. The normally closed relay **25** includes a trigger input, a power input and a power output. The photocell output is connected to the trigger of the normally closed relay **25**. A power output of the WiFi switch **14** (alternatively the DC power supply **20** or the battery **22**) is connected to a power input of the normally closed relay **25**. The power output of the normally closed relay **25** is connected to a power input of the position adjustable camera **10**. The output of the photocell **27** between dusk and dawn opens the normally closed relay **25**, so that the camera **10** is not supplied with electrical power. The normally closed relay is preferably a solid state relay, such as a LCB710, but other relays may also be used. A pin layout of the LCB710 is found at <https://article.oemsecrets.com/product-articles/anerds-dream>, which is hereby incorporated by reference in its entirety. The normally closed relay **25** or any other suitable inverter device inverts the voltage output from the photocell **27** from a voltage high to a voltage low or a voltage low to a voltage high, so the camera **10** is not powered at night.

The WiFi switch **14** allows operation of the position adjustable camera **10**. The wireless device **16** is preferably a smart cellular phone. The wireless phone **16** includes a display screen **17**. The control software program **18** is loaded on to a wireless phone with a platform, such as Android or Apple. The control software program **18** provides an interface between the user and control of the position adjustable camera **10**. The control software program **18** provides interface through a display screen **17** of the wireless phone **16**. A photo or video is also displayed on the screen **17**. With reference to FIG. 2, the control software program **18** includes the capability of adding at one least camera in box **28** and naming the camera in box **30**. A camera is selected from a list of cameras in box **32**; and the camera is opened in box **34**. A start viewing box **36** is chosen, which provides multiple options for control of the position adjustable camera **10**. The position adjustable camera **10** may be panned, tilted, or a lens zoomed in box **38**. An image may be inverted in box **40**. A motion sensor in the position adjustable camera **10** allows the camera to start recording an image or live streaming upon sensing the presence of an animal. The triggering of a recording by the motion sensor may be activated or deactivated in box **42**. The triggering of a recording preferably sends a motion alert notice to the wireless phone **16**. Still photos are chosen in box **44**; live stream recordings are made in box **46**; and the live stream recordings are stopped in box **48**. Viewing of images is stopped in box **50**. Photographs (still images) are stored in the image gallery **52**. Video (recorded) images are stored in the image gallery **52**, after the recording is stopped in box **48**.

In use, at least one position adjustable camera **10** is placed in an area frequented by animals or potentially traveled by animals. The cellular hot spot **12** is set-up near the at least one position adjustable camera **10**. Alternatively, the cellular hot spot **12** may be embedded into the position adjustable camera **10**. The cellular hot spot **12** communicates directly with the at least one position adjustable camera **10**. The cellular hot spot **12** communicates with a cell tower **100**. The user uses their wireless phone **16** to communicate with the at least one position adjustable camera **10** through the cell tower **100** and cellular hot spot **12**. More than one wireless phone **16** may be used to communicate with the at least one position adjustable camera **10** at the same time. The cellular hot spot **12** may be created to interface with most cellular carriers, such as Verizon, AT & T, Sprint and the like, or a specific cellular hot spot **12** may be a specific cellular carrier.

4

The cellular hot spot **12** communicates with the WiFi switch **14** to power-up or power-down the at least one position adjustable camera **10**. The hot spot **12** and the WiFi switch **14** are powered by the AC-DC power supply **20**, the battery **22**, or a combination of the battery **22** and the solar panel **24**. The user controls the operation of the at least one position adjustable camera **10** with the control software program **18** through the display screen **17** on the wireless phone **16**. The at least one position adjustable camera **10**, the cellular hotspot **12**, the WiFi switch **14**, the at least one wireless phone **16**, the AC-DC power supply **20**, the storage battery **22** and the solar panel **24** are all portable and weather protected.

While particular embodiments of the invention have been shown and described, it will be obvious to those skilled in the art that changes and modifications may be made without departing from the invention in its broader aspects, and therefore, the aim in the appended claims is to cover all such changes and modifications as fall within the true spirit and scope of the invention.

I claim:

1. An outdoor system for live streaming a at least one position adjustable camera through a cell tower to at least one wireless device, comprising:

said at least one position adjustable camera is located in the outdoors;

at least one motion detector is connected to said at least one position adjustable camera;

a cellular hot spot for wireless connection to a cell tower, an electrical power device for supplying electrical power to said at least one position adjustable camera from dawn to dusk, wherein movement of an animal tripping said at least one motion detector, said at least one motion detector sending a control signal to said at least one position adjustable camera to capture an image or a video of the animal, said at least one position adjustable camera sending said image or video through a WiFi signal to said cellular hot spot, said cellular hot spot sending said image or video through the cell tower to the at least one wireless device;

a control software program for installation on the at least one wireless device, wherein said control software program is capable of providing remote operation of said at least one position adjustable camera; and

said control software program enables multiple users through multiple cellular phones to access said at least one position adjustable camera at the same time.

2. The outdoor system for live streaming of claim 1 wherein:

the at least one wireless device includes a display screen for operating functions of said control software program.

3. The outdoor system for live streaming of claim 1 wherein:

said at least one position adjustable camera includes a motion sensor for triggering a motion alert notice and a photo image.

4. The outdoor system for live streaming of claim 1 wherein:

each one of said least one position adjustable camera includes the ability to be turned on and off; pan 360 degrees; and tilt-trim 120 degrees.

5. The outdoor system for live streaming of claim 1 wherein:

said control software program includes the capability of panning and tilting said at least one position adjustable camera;

5

a lens of said at least one position adjustable camera is capable of being zoomed; and
inverting an image.

6. The outdoor system for live streaming of claim 1 wherein:

said control software program includes a gallery for storing images, videos and the capability of building an album in said gallery.

7. The outdoor system for live streaming of claim 1 wherein:

said at least one position adjustable camera being powered with an AC-DC Power supply powered by an electrical outlet; a storage battery; or a combination of said storage battery and a solar panel.

8. The system for live streaming of claim 1, further comprising:

a photocell detects when dusk and dawn occur, an inverter device is used to invert a voltage output of said photocell, a power output of said WiFi switch is connected to said photocell, an output of said inverter device is connected to a power input of said position adjustable camera, wherein said position adjustable camera is powered between dawn and dusk.

9. The system for live streaming of claim 1 wherein:

said cellular hot spot is embedded in said at least one position adjustable camera.

10. An outdoor system for live streaming at least one position adjustable camera through a cell tower to at least one wireless device, comprising:

said at least one position adjustable camera is located in the outdoors;

at least one motion detector is connected to said at least one position adjustable camera;

a cellular hot spot for wireless connection to the cell tower, wherein movement of an animal tripping said at least one motion detector, said at least one motion detector sending a control signal to said at least one position adjustable camera to capture an image or a video of the animal, said at least one position adjustable camera sending said image or video through a WiFi signal to said cellular hot spot, said cellular hot spot sending said image or video through the cell tower to the at least one wireless device;

a control software program for installation on the at least one wireless device, wherein said control software program is capable of providing remote operation of said at least one position adjustable camera, said control software program providing live streaming of an image as seen by said at least one position adjustable camera; and

6

said control software program enables multiple users through multiple cellular phones to access said at least one position adjustable camera at the same time.

11. The outdoor system for live streaming of claim 10 wherein:

the at least one wireless device includes a display screen for operating functions of said control software program.

12. The outdoor system for live streaming of claim 10 wherein:

said at least one position adjustable camera includes a motion sensor for triggering a motion alert notice and a photo image.

13. The outdoor system for live streaming of claim 10 wherein:

each one of said least one position adjustable camera includes the ability to be turned on and off; pan 360 degrees; and tilt-trim 120 degrees.

14. The outdoor system for live streaming of claim 10 wherein:

said control software program includes the capability of panning and tilting said at least one position adjustable camera;

a lens of said at least one position adjustable camera is capable of being zoomed; and

inverting an image.

15. The outdoor system for live streaming of claim 10 wherein:

said control software program includes a gallery for storing images, videos and the capability of building an album in said gallery.

16. The outdoor system for live streaming of claim 10 wherein:

said at least one position adjustable camera being powered with an AC-DC Power supply powered by an electrical outlet; a storage battery; or a combination of said storage battery and a solar panel.

17. The outdoor system for live streaming of claim 10, further comprising:

a photocell detects when dusk and dawn occur, an inverter device is used to invert a voltage output of said photocell, a power output of said WiFi switch is connected to said photocell, an output of said inverter device is connected to a power input of said position adjustable camera, wherein said position adjustable camera is powered between dawn and dusk.

18. The outdoor system for live streaming of claim 10 wherein:

said cellular hot spot is embedded in said at least one position adjustable camera.

* * * * *